Overview of the DOE Hanford Site Solid *(Radioactive and Hazardous)* Waste Program Environmental Impact Statement, Richland, Washington

Background

The Hanford Site occupies approximately 560 square miles adjacent to the Columbia River, principally in Benton and Franklin Counties of Washington, extending approximately 25 miles north of Richland, Washington. The Hanford Site was established to process nuclear materials in support of U. S. defense efforts during World War II. The Hanford Site defense production facilities included fuel fabrication facilities, nuclear production reactors, separation facilities, product preparation facilities, research facilities, and waste management facilities. These activities have generated a variety of radioactively contaminated equipment as well as radioactive and hazardous wastes, including low-level radioactive waste (LLW), mixed low-level radioactive and hazardous waste (MLLW), transuranic radioactive and mixed waste (TRU), and hazardous waste (HW). At present, the production facilities at Hanford have been shut down, and the Hanford Site is in transition to other missions. These missions include an increased emphasis on managing waste in a safe and cost-effective manner, and in accordance with applicable federal, state and local regulations.

DOE is required by the Atomic Energy Act (42 USC 2011 et.seq.) to manage the radioactive wastes that it generates. In addition, DOE needs to make decisions concerning management of wastes that have hazardous components in order to comply fully with the Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et.seq.), the Toxic Substances Control Act (TSCA), and other applicable regulations. The Hanford Federal Facility Agreement and Consent Order (referred to as the "Tri-Party Agreement," or TPA) is an interagency agreement among DOE, the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology). As part of this agreement, DOE and the regulators agreed to establish milestones to bring operating facilities into compliance with RCRA and to coordinate clean up of past Hanford disposal sites under CERCLA over the next 30 years.

Why is the DOE preparing an EIS for the Solid Waste Program?

The DOE Solid Waste Program at Hanford is preparing an EIS in order to:

- update NEPA coverage for ongoing activities,
- implement programmatic records of decision (RODs) that result from the Final Waste Management Programmatic Environmental Impact Statement (WM-PEIS, DOE/EIS-0200-F), and
- facilitate site- and program-specific decisions on the future operation of its solid waste treatment, storage, and disposal (TSD) facilities.

What is the purpose of this EIS?

This EIS will provide a comprehensive analysis of the impacts of the proposed action and alternatives, as well as potential cumulative impacts of the alternatives with other relevant past, present, and reasonably foreseeable activities at the site. The ultimate goal is to provide environmental analysis to support the development of specific decisions needed for the types of waste managed at the Hanford Site by the DOE Solid Waste Program.

How will the alternatives for this EIS be developed?

The proposed action(s), as well as alternatives to the proposed actions, will be developed and structured in such as way as to provide consistency with Waste Management EISs at other DOE sites and with the DOE Programmatic Waste Management EIS. Alternatives to the proposed actions were defined to encompass the range of waste management activities that might be undertaken at Hanford. The following descriptions indicate the general approach to development of these alternatives:

- ***No Action:*** Evaluation of this alternative is required by regulation, and it provides a baseline against which to evaluate the other alternatives. In the context of this EIS, the no action alternative generally represents a near-term continuation of current activities, with a gradual long-term reduction of site-wide effort related to managing all types of radioactive and hazardous solid waste as existing treatment, storage, and disposal (TSD) facilities reach capacity.
- ***Minimize TSD activities at Hanford:*** This alternative is intended to result in minimal use of facilities at Hanford while maximizing offsite options for management of radioactive and hazardous wastes at either commercial facilities or alternate DOE sites.
- ***Maximize TSD activities at Hanford:*** This alternative involves use of Hanford Site land and facilities to provide the most complete onsite management possible for radioactive and hazardous wastes generated onsite. It also provides for management of wastes from offsite facilities if the DOE WM-PEIS RODs or other national-level decisions identify the Hanford Site as a regional or national management site for specific types of waste.

- ***Proposed Action:*** This alternative represents the current long-term programmatic planning baseline. In general, it combines features from the other alternatives, with options for management of some radioactive and hazardous wastes from offsite facilities at Hanford, as well as offsite TSD for some types of waste generated at Hanford.

What waste types will be considered in this EIS?

The Hanford Solid (Radioactive and Hazardous) Waste Program EIS will evaluate alternatives for management of the Solid Waste Program's radioactive and hazardous wastes generated at the Hanford Site, or that which is received from offsite generators, with emphasis on the 20-year period covered by the WM-PEIS. The specific waste types to be considered include:

- low-level radioactive waste (LLW),
- mixed low-level radioactive and hazardous waste (MLLW),
- transuranic radioactive and mixed waste (TRU),
- hazardous waste (HW), and
- contaminated equipment and materials for reuse, recycle, or disposal.

Specific decisions needed for the types of waste managed at the Hanford Site by the DOE Solid Waste Program are described in the following sections.

What waste types will not be considered in this EIS?

The Hanford Solid (Radioactive and Hazardous) Waste Program EIS will not evaluate alternatives for the following waste types, because they have been, or will be, addressed by separate NEPA reviews or other appropriate documentation:

- high-level radioactive waste,
- most liquid wastes,
- most spent nuclear fuel,
- naval reactor compartments,
- remediation wastes, and
- pre-1970 buried waste.

Waste Type Description and Proposed Action

The following will briefly provide the definition, source of generation, waste volume, need for evaluation, and examples of activities that may take place under the proposed action for each waste type to be considered in this EIS.

Low-Level Radioactive Waste (LLW)
Definition: In general, low-level radioactive waste is defined as that which is not classified as either transuranic or high-level radioactive waste. Greater than Category 3 (GTC3) wastes consist of LLW that currently cannot be disposed of in LLW burial grounds. The most common forms of solid low-level radioactive

waste include operating and laboratory wastes (i.e., protective clothing, plastic sheeting, gloves, analytical wastes, decontamination residues), contaminated equipment, reactor and reactor fuel hardware, spent lithium-aluminum targets from which tritium has been extracted, and spent deionizer resin from reactor operations.

Source of Generation: The analytical laboratories, reactors, separations facilities, plutonium processing facilities, and waste management activities generated most of the low-level waste currently managed at Hanford. Analytical laboratories, research facilities, facility decommissioning, site clean-up, waste management activities, and other onsite and offsite facilities would likely continue to generate additional wastes in the foreseeable future.

Approximate Volume: It was estimated in the WM-PEIS that the Hanford Site inventory of LLW, including that generated during the next 20 years, would amount to 89,000 m^3 (or 6% of the LLW in the DOE complex). The WM-PEIS preferred alternative identifies Hanford as a possible regional management site for some LLW from other DOE facilities.

Need: DOE needs to determine the treatment, storage and disposal activities required to properly manage solid LLW that currently exists at Hanford, and which may be received from onsite or offsite facilities in the future by the Solid Waste Program. Currently, most of the LLW is certified, packaged to meet waste acceptance criteria, and placed in the Low Level Waste Burial Grounds (LLBGs). Limited quantities of waste that cannot meet waste disposal criteria (GTC3 wastes) are currently stored at various facilities until methods are developed for their final disposition. To ensure proper disposition of LLW, DOE needs to evaluate decisions for permanent disposal including expansion or reconfiguration and ultimate closure of the current facilities. Future treatment, storage, and disposal options also are required for the GTC3 waste at either onsite or offsite facilities.

Proposed Action: The following lists examples of activities that the DOE Solid Waste Program may include as part of the proposed action for LLW:

- Disposal of LLW in onsite LLBGs
- Alternative methods for closure of LLBGs
- Possible expansion of LLBGs/reconfiguration of trenches
- Receipt of offsite waste or shipment of Hanford waste to other sites
- Examine treatment and storage options for LLW that cannot be disposed in existing LLBGs (e.g., GTC3 wastes).

Mixed Low-Level Waste (MLLW)

Definition: Mixed low-level waste is defined as waste materials containing both low-level radioactive and hazardous components. Hazardous components may include lead and other heavy metals, solvents, paints, oils, other hazardous organic materials, or components that exhibit RCRA characteristics of toxicity, ignitability, corrosivity, or reactivity. The waste forms are typically similar to those described for low-level radioactive waste.

Source of Generation: The waste materials have been generated from reactor operations, separation facilities, laboratory operations and continuing waste

management activities and consist of sludges, ashes, resins, paint wastes, soils, equipment and components. Past operations have resulted in contamination of these wastes with both radioactive and hazardous materials.

Waste Volume: It was estimated in the WM-PEIS that the Hanford Site inventory of MLLW, including that generated during the next 20 years, would amount to 36,000 m^3 (or 16% of the MLLW in the DOE complex). The WM-PEIS preferred alternative identifies Hanford as a possible regional management site for some MLLW from other DOE facilities.

Need: DOE needs to determine the treatment, storage and disposal activities required to properly manage solid MLLW that currently exists at Hanford, and which may be received from onsite or offsite facilities in the future by the Solid Waste Program. Currently, treatment options for some types of MLLW remain to be developed. Most MLLW at the Hanford site is currently stored in the Central Waste Complex (CWC) or other storage facilities awaiting final disposition.

Proposed Action: The following lists examples of activities that the DOE Solid Waste Program may include as part of the proposed action for MLLW:

- Continued and expanded (as needed) use of treatment services from offsite vendors or other DOE facilities.
- Development of new treatment technologies/facilities (included in TPA milestone M-91)
- Options for receiving MLLW from offsite facilities
- Disposal of MLLW in onsite trenches
- Expansion of MLLW trenches
- Development and implementation of new leachate treatment technologies, as required
- Disposal of treated leachate
- Closure of MLLW trenches (development of alternative methods)

Transuranic Radioactive and Mixed Waste (TRU)
Definition: TRU waste contains radioactive isotopes with atomic numbers greater than 92 and half-lives longer than 20 years at concentrations exceeding 100 nanocuries of alpha-emitting radionuclides per gram. These wastes may also contain hazardous components similar to those described for MLLW.

Source of Generation: Transuranic radioactive and mixed wastes are generated in a similar manner to LLW and MLLW as described above. The major difference is that they are radioactively contaminated with transuranic isotopes and are most often generated by operations at plutonium handling facilities.

Waste Volume: It was estimated in the WM-PEIS that the Hanford Site inventory of TRU waste, including that generated during the next 20 years, would amount to 52,000 m^3 (38% of the TRU in the DOE complex). However, more recent estimates at the Hanford Site show that approximately 22,400 m^3 of TRU waste will be managed by Hanford in the next 20 years. Of this 22,400 m^3, approximately 16,300 m^3 is existing in below- and above-ground storage at the site. The reason for the significant change between the WM-PEIS and the revised Hanford baseline is due to a decrease in forecast estimates for TRU waste that will be generated over the next 20 years.

Need: DOE needs to determine the retrieval, treatment, and storage activities required to properly manage solid TRU that currently exists at Hanford, and which may be received from onsite or offsite facilities in the future by the Solid Waste Program. Since 1970, DOE has retrievably stored TRU waste in trenches and caissons at the Hanford Site with some TRU waste in above ground storage buildings. DOE plans to dispose of the existing inventory of TRU waste and anticipated future quantities of TRU waste in the geologic repository known as the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. In order to meet WIPP waste acceptance criteria, treatment and certification capabilities, such as those at the Waste Receiving and Processing Facility (WRAP), must be available to the Hanford Site. Additionally, DOE needs to evaluate options for transition of existing facilities managed by the Solid Waste Program to other uses or for final deactivation.

Proposed Action: The following lists examples of activities that the DOE Solid Waste Program may include as part of the proposed action for TRU:

- Retrieval and characterization of part or all of the post-1970 TRU waste from trenches, caissons, or other source
- Continued storage or disposal of some of the wastes in-place or in existing canyon facilities
- Interim storage at the Central Waste Complex
- Receipt of some offsite TRU waste
- Treatment of contact-handled TRU in WRAP
- Development of treatment technology and facilities for management of remote-handled and other special TRU waste (TPA milestone M-91, with possible use of T-Plant or offsite facilities)
- Shipment of small volumes of unique wastes to other DOE facilities
- Prepare treated and packaged TRU for shipment to WIPP

Hazardous Waste (HW)
Definition: Hazardous wastes are similar to MLLW except that they have not been contaminated with radioactive materials. Hazardous components include materials such as lead and other heavy metals, solvents, paints, oils, other hazardous organic materials, or materials that exhibit RCRA characteristics of ignitability, corrosivity, or reactivity.

Source of Generation: HW are generated from activities such as facility operations, decontamination and decommissioning of facilities, environmental restoration, waste management, and vehicle maintenance.

Waste Volume: It was estimated in the WM-PEIS that the Hanford Site inventory of HW, including that generated during the next 20 years, would amount to 6,100 m^3 (9% of the HW in the DOE complex).

Need: DOE needs to determine the activities required to properly manage its existing and anticipated solid HW. Currently, non-wastewater HW is stored, packaged, and shipped to an offsite commercial facility for treatment and disposal. DOE needs to decide the extent to which it should continue to rely on commercial facilities, and to determine the effects these decisions will have on utilization of existing HW facilities or possible requirements for additional facilities to manage solid HW.

Proposed Action: The following lists examples of activities that the DOE Solid Waste Program may include as part of the proposed action for HW:

- Package all existing and newly generated HW for offsite TSD
- Shipment of all existing and newly generated HW to offsite TSD facilities
- Maintain the existing HW storage facility (616 building) in standby for possible future use.

Contaminated Equipment:
Definition: Contaminated equipment primarily includes sampling equipment, augers, cranes, construction equipment, and stainless steel, lead-lined shielded receivers from tank farm operations. Past activities at Hanford and other facilities have resulted in contamination of equipment so it is no longer suitable for use in ongoing operations. Some of the equipment is potentially useable or recyclable in the future if the radioactive contamination could be removed or reduced to acceptable levels. In other cases, decontamination of the equipment may be desirable prior to disposal to minimize worker exposure or to reduce the volume of material that must be disposed of as radioactive waste.

Source of Generation: Approximately 80% of the contaminated equipment results from activities within the tank farms.

Equipment Volume: Estimates vary from year to year depending on the size of the project and the size of the equipment. Capabilities exist on a "as needed" basis for decontamination services.

Need: DOE needs to determine the storage and treatment activities required to properly manage contaminated equipment and materials that currently exist, or which may be received from onsite or offsite facilities by the Solid Waste Program. Currently, decontamination services are provided at the existing 2706-T and 221-T (T-Plant canyon) facilities at Hanford. However, additional services and methods may be viable for releasing previously contaminated equipment and materials for recycle, reuse, or disposal.

Proposed Action: The following lists examples of activities that the DOE Solid Waste Program may include as part of the proposed action for contaminated materials and equipment:

- Continue decontamination activities at existing facilities (2706-T)
- Investigate (and implement as needed) other decontamination methods and technologies (e.g., mobile decontamination systems or use of commercial decontamination systems)
- Receipt of some offsite equipment for decontamination
- Investigate alternate future uses for T-Plant

Public Input to the Scope of the Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS

During the public scoping period which extends from publication of the Notice of Intent and continues until December 11, 1997, DOE is seeking public input regarding issues to be considered, alternatives to be analyzed, and environmental impacts to be addressed in the Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS. Comments may be provided in writing, by FAX or electronic mail. Oral and written comments will also be accepted during public meetings to be held at the dates and places indicated below.

Written, Faxed, and Electronic Comments: Comments should be directed to Ms. Allison Wright, NEPA Document Manager, at the following:

Ms. Allison Wright, NEPA Document Manager (S7-55)
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U.S. Department of Energy
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Richland, Washington 99352
FAX: 509-372-1926
Email: solid_waste_eis_-_doe@RL.gov

To reserve a time to speak or to request a copy of the Notice of Intent, call 509-373-7840 or send an Email to: solid_waste_eis_-_doe@RL.gov

Additional information on DOE and Hanford Site NEPA activities and documents may also be obtained at the following addresses on the world-wide web:

- DOE NEPA Information - http://tis.eh.doe.gov/nepa/
- Hanford Information - http://www.hanford.gov/hanford.html
- Hanford Environmental Assessments - http://www.hanford.gov/hanford.html#ea
- Hanford Environmental Impact Statements - http://www.hanford.gov/hanford.html#eis

Public Scoping Meetings: Oral and written comments will be received at public scoping meetings to be held at the following times:

November 12, 1997, public hearings: 1 p.m. - 4 p.m. and 7 p.m. - 10 p.m.
Federal Building Auditorium, 825 Jadwin, Richland, WA 99352.

November 13, 1997, public hearing: 7 p.m. - 10 p.m.
VERT Memorial Building, 500 S.W. Dorion, Pendleton, OR 97801.